

Having thus described the preferred embodiment, the invention is now claimed to be:

1. A variable displacement vane pump, comprising:  
a housing having an inlet and an outlet communicating with a pump chamber formed in the housing;  
a rotor rotably received within the housing, the rotor having at least one generally radially extending slot; and  
a vane assembly pivotally received in each slot.
2. The variable displacement vane pump of claim 1 wherein each vane assembly includes a rocker member having a rounded surface region pivotally mounted within the slot of the rotor.
3. The variable displacement vane pump of claim 1 wherein each vane assembly includes a rocker member that receives a roller member that is mounted for relative rotation thereto.
4. The variable displacement vane pump of claim 3 wherein each rocker member includes a bearing surface surrounding at least one-quarter of a perimeter of the roller member.
5. The variable displacement vane pump of claim 4 wherein the bearing surface surrounds about 300 degrees of a perimeter of the roller member.
6. The variable displacement vane pump of claim 1 wherein the vane assembly includes a hydrostatic pad.
7. A variable displacement vane pump comprising:

a housing having a wall, an inlet, and an outlet communicating with a pump chamber formed in the housing;

a rotor received within the housing for rotation about a center of rotation, the rotor including a peripheral surface and at least one recessed wall defining a slot; and

a vane assembly operatively mounted in each rotor slot, the vane assembly including an inner surface facing the center of rotation and an outer surface facing the peripheral surface, wherein the vane assembly inner surface and rotor recessed wall define a first pumping chamber, and the vane assembly outer surface, the rotor peripheral surface and the housing wall define a second pumping chamber;

wherein, the first pumping chamber volume and the second pumping chamber volume contribute substantially equal pumping action to the pump.

8. The pump of claim 7 wherein the recessed wall comprises a driving wall portion having an arcuate bearing surface that receives the vane assembly.

9. The pump of claim 7 wherein the recessed wall further comprises an arcuate leading wall portion.

10. The pump of claim 9 wherein the vane assembly includes an arcuate leading surface that bears against the recessed wall arcuate leading wall portion.

11. A variable displacement vane pump comprising:  
a housing;  
a rotor received within the housing for rotation about a center of rotation, the rotor having a peripheral surface and a plurality of slots;  
a rocker member received in each slot for pivoting movement therein;  
a roller member received in each rocker member for rotation relative thereto;

first and second cam segments each operatively mounted within the housing and independently movable relative to and cooperatively with the rotor to create varying volumetric pumping chambers;

at least one inlet provided in the housing for introducing fluid into the plurality of pumping chambers; and

at least one outlet provided in the housing for discharging fluid from the plurality of pumping chambers.

12. The pump of claim 11 further comprising first and second port plates positioned on opposite axial sides of the rotor.

13. The pump of claim 12 wherein the first and second port plates define at least one pressure inlet channel for directing fluid into the plurality of slots receiving the rocker members and at least one pressure outlet channel for directing fluid out of the plurality of slots receiving the rocker members.

14. The pump of claim 13 wherein the first and second port plates further define at least one pressure outlet channel for directing fluid out of a volume defined by the housing, the peripheral surface and the roller member, wherein the outlet channel for directing fluid out of the plurality of slots can direct nearly an equal volume of fluid as the outlet channel for directing fluid out of the volume defined by the housing, the peripheral surface and the roller member.

15. A variable vane displacement vane pump comprising:  
a housing having a wall forming a pump chamber, an inlet and an outlet that communicates therewith;  
a rotor rotatably received in the pump chamber having circumferentially spaced slots extending generally radially inward from a periphery of the rotor, each slot including an enlarged curvilinear pivot bearing surface and an arcuate sliding surface disposed on generally opposite sides of the rotor slot;

a rocker received in the slot having a partially cylindrical bearing hub dimensioned for pivoting receipt in the pivot bearing surface and an arcuate surface adapted for sliding movement radially inward and outward along the arcuate sliding surface of the rotor slot; and

a roller received in the rocker and extending outwardly therefrom for engagement with the pump chamber wall.